Certified
Naval Battle Groups

U.S. Navy Battle Force Interoperability Certification

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NAVSEA 53

NDIA System Engineering Conference Oct 21-24 2002

Agenda

- The Problem
- Naval Sea Systems Command (NAVSEA) Role
- Deployment Minus 30 Month (D-30) Process
- Distributed Engineering Plant (DEP)
- Battle Force Interoperability (BFI) Certification Criteria
- Battle Force Interoperability Testing (BFIT)
- Capabilities and Limitations (CAPs & LIMs) Document
- Future Initiatives

Major Interoperability Problems

ASCIET 95,96,97,99

HUE CITY VICKSBURG

BGSIT REPORTS ON DEPLOYING BGs


The Worldwide Weekly

DEFENSE NEWS

U.S. Navy Halts Aegis Upgrades

Billions of Dollars In New Capabilities Require Better Plan For Software Links

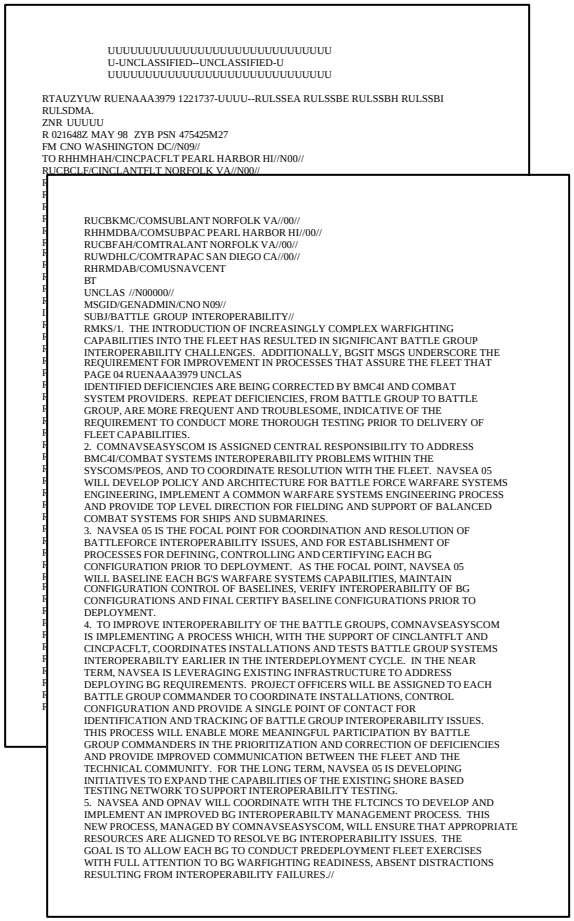
ACDS BLOCK I OPEVAL

EISENHOWER BG

AEGIS BASELINES 5.3/6.1

Immediate Action Needed to Correct Interoperability Problems

A New Proposal



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RUCBCLF/CINCLANTFLT NORFOLK VA//N00//

RUCBKMC/COMSUBLANT NORFOLK VA//00//
RHHMDBA/COMSUBPAC PEARL HARBOR HI//00//
RUCBFAH/COMTRALANT NORFOLK VA//00//
RUWDHLC/COMTRAPAC SAN DIEGO CA//00//
RHRMDAB/COMUSNAVCENT
BT
UNCLAS //N00000//
MSGID/GENADMIN/CNO N09//
SUBJ/BATTLE GROUP INTEROPERABILITY//
RMKS/1. THE INTRODUCTION OF INCREASINGLY COMPLEX WARFIGHTING CAPABILITIES INTO THE FLEET HAS RESULTED IN SIGNIFICANT BATTLE GROUP INTEROPERABILITY CHALLENGES. ADDITIONALLY, BGSIT MSGS UNDERSCORE THE REQUIREMENT FOR IMPROVEMENT IN PROCESSES THAT ASSURE THE FLEET THAT
PAGE 04 RUENAAA3979 UNCLAS
IDENTIFIED DEFICIENCIES ARE BEING CORRECTED BY BMC4I AND COMBAT SYSTEM PROVIDERS. REPEAT DEFICIENCIES, FROM BATTLE GROUP TO BATTLE GROUP, ARE MORE FREQUENT AND TROUBLESOME, INDICATIVE OF THE REQUIREMENT TO CONDUCT MORE THOROUGH TESTING PRIOR TO DELIVERY OF FLEET CAPABILITIES.
2. COMNAVSEASYSCOM IS ASSIGNED CENTRAL RESPONSIBILITY TO ADDRESS BMC4I/COMBAT SYSTEMS INTEROPERABILITY PROBLEMS WITHIN THE SYSCOMS/PEOS, AND TO COORDINATE RESOLUTION WITH THE FLEET. NAVSEA 05 WILL DEVELOP POLICY AND ARCHITECTURE FOR BATTLE FORCE WARFARE SYSTEMS ENGINEERING, IMPLEMENT A COMMON WARFARE SYSTEMS ENGINEERING PROCESS AND PROVIDE TOP LEVEL DIRECTION FOR FIELDING AND SUPPORT OF BALANCED COMBAT SYSTEMS FOR SHIPS AND SUBMARINES.
3. NAVSEA 05 IS THE FOCAL POINT FOR COORDINATION AND RESOLUTION OF BATTLEFORCE INTEROPERABILITY ISSUES, AND FOR ESTABLISHMENT OF PROCESSES FOR DEFINING, CONTROLLING AND CERTIFYING EACH BG CONFIGURATION PRIOR TO DEPLOYMENT. AS THE FOCAL POINT, NAVSEA 05 WILL BASELINE EACH BG'S WARFARE SYSTEMS CAPABILITIES, MAINTAIN CONFIGURATION CONTROL OF BASELINES, VERIFY INTEROPERABILITY OF BG CONFIGURATIONS AND FINAL CERTIFY BASELINE CONFIGURATIONS PRIOR TO DEPLOYMENT.
4. TO IMPROVE INTEROPERABILITY OF THE BATTLE GROUPS, COMNAVSEASYSCOM IS IMPLEMENTING A PROCESS WHICH, WITH THE SUPPORT OF CINCLANTFLT AND CINCPACFLT, COORDINATES INSTALLATIONS AND TESTS BATTLE GROUP SYSTEMS INTEROPERABILTY EARLIER IN THE INTERDEPLOYMENT CYCLE. IN THE NEAR TERM, NAVSEA IS LEVERAGING EXISTING INFRASTRUCTURE TO ADDRESS DEPLOYING BG REQUIREMENTS. PROJECT OFFICERS WILL BE ASSIGNED TO EACH BATTLE GROUP COMMANDER TO COORDINATE INSTALLATIONS, CONTROL CONFIGURATION AND PROVIDE A SINGLE POINT OF CONTACT FOR IDENTIFICATION AND TRACKING OF BATTLE GROUP INTEROPERABILITY ISSUES. THIS PROCESS WILL ENABLE MORE MEANINGFUL PARTICIPATION BY BATTLE GROUP COMMANDERS IN THE PRIORITIZATION AND CORRECTION OF DEFICIENCIES AND PROVIDE IMPROVED COMMUNICATION BETWEEN THE FLEET AND THE TECHNICAL COMMUNITY. FOR THE LONG TERM, NAVSEA 05 IS DEVELOPING INITIATIVES TO EXPAND THE CAPABILITIES OF THE EXISTING SHORE BASED TESTING NETWORK TO SUPPORT INTEROPERABILITY TESTING.
5. NAVSEA AND OPNAV WILL COORDINATE WITH THE FLTCINCS TO DEVELOP AND IMPLEMENT AN IMPROVED BG INTEROPERABILTY MANAGEMENT PROCESS. THIS NEW PROCESS, MANAGED BY COMNAVSEASYSCOM, WILL ENSURE THAT APPROPRIATE RESOURCES ARE ALIGNED TO RESOLVE BG INTEROPERABILITY ISSUES. THE GOAL IS TO ALLOW EACH BG TO CONDUCT PREDEPLOYMENT FLEET EXERCISES WITH FULL ATTENTION TO BG WARFIGHTING READINESS, ABSENT DISTRACTIONS RESULTING FROM INTEROPERABILITY FAILURES.//

- **CNO DIRECTION**
  NAVSEA is assigned central responsibility to address BMC4I/Combat Systems interoperability problems within the SYSCOMS/PEOs, and to coordinate resolution with the fleet.
  (CNO MSG 021648Z May 98)
- **SEA 05 (SEA 53)**
  Warfare Systems Directorate stood up to implement CNO direction

1998 – SEA 53 Assigned BFI Leadership Role

Initial NAVSEA 53 Solutions

- The D-30 Process (Deployment Minus 30 Months)
  - Disciplined System Engineering Process for Preparing/Deploying Interoperable BF
  - Starts With Baseline Management of Entire Battle Force
  - Battle Group Integration Schedule With Defined Milestones
  - Focuses Platform and System Integration Toward BF Certification
- The Distributed Engineering Plant (DEP)
  - A High-fidelity, Shorebased BF Testbed
  - Federating Dispersed Combat System Sites
    - ATM Networking Technology (Especially the KG-75 Network Encryptor)
    - Multi-site Scheduling
- The Battle Force Interoperability Test (BFIT)
  - A Shorebased Test of an Integrated Battle Force
    - Characterizes the Interoperability of the Battle Force
    - Utilizes the DEP to Emulate the Battle Force Ashore
    - A Critical Milestone for BF Certification

Players in the D-30 Process

- **FLTCINCs** - Customer owning the D-30 process; CLF/CPF joint instruction 4720.3A dictates
- **NAVSEA 53** - FLTCINC's agent managing the process
- **SYSCOMs** - Suppliers to the process providing ever increasing capability to the BF
- **SPMs** - OPNAV agent for configuration control & technical authority
- **Battle Force** - Recipients of the final product that provide important feedback to improving the process

Customer Owns the Process

D-30 Purpose and Scope

(Ref: CLF/CPF Inst 4720.3A)

- **Purpose**

  Increase readiness of deploying battle force through a disciplined process that includes configuration management, integrated testing and certification

- **Encompasses**

  Command, Control, Communication, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) and Combat Systems

The FLTCINCs Process

D-30 Process

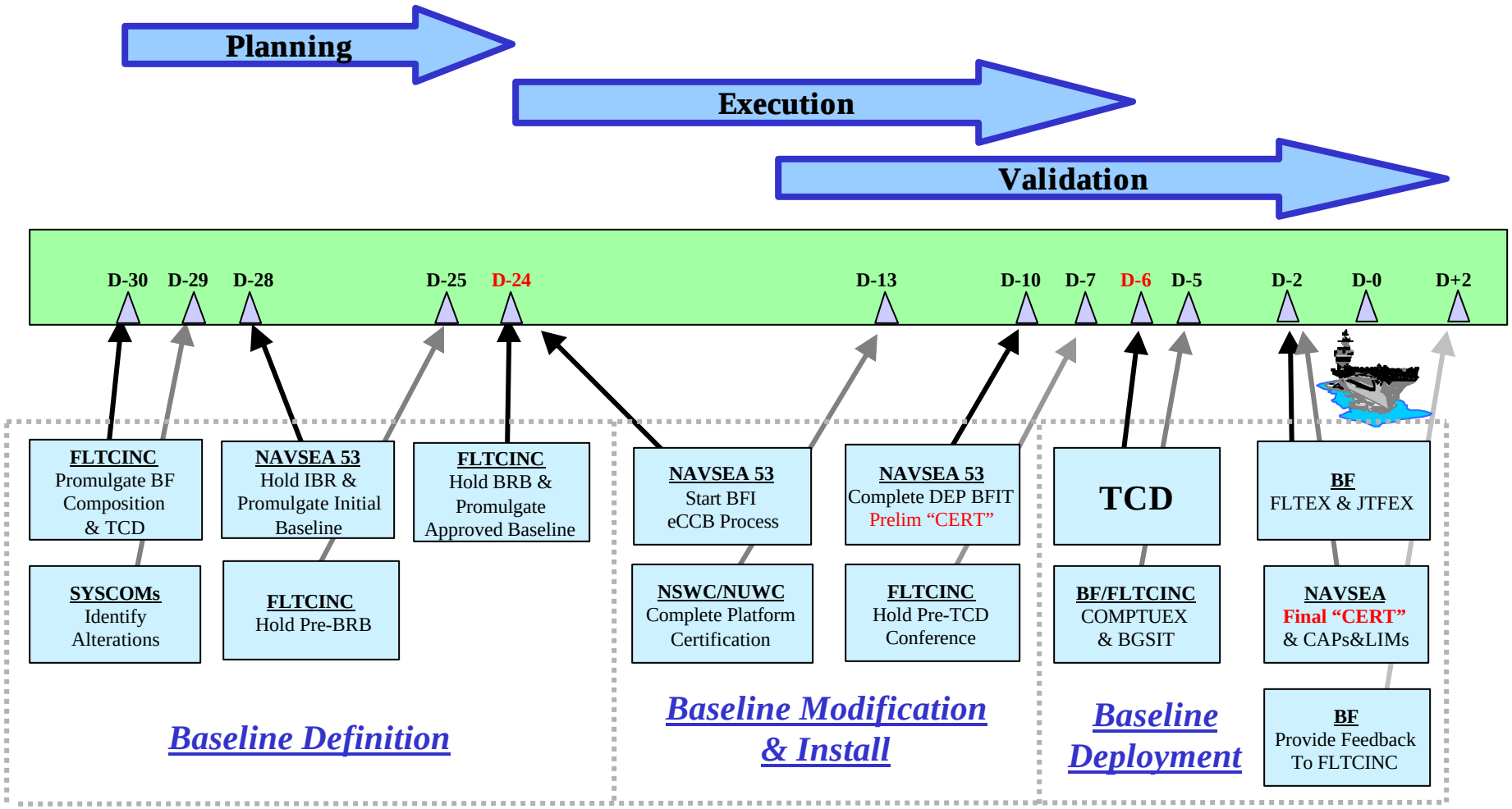
- A *Disciplined* 30-Month process that optimizes New Capability with Interoperability

- The Process Includes -

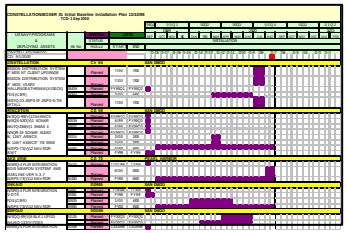
  - *Planning* - Baseline Definition
  - *Execution* - Baseline Modification and Installation
  - *Validation* - Testing, Capabilities and Limitations, Feedback

Manages Interoperability Risk for the Fleet

Notional D-30 Process

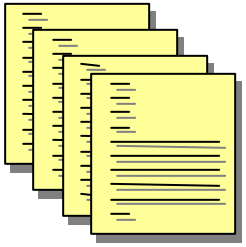


D-30 Tools and Products

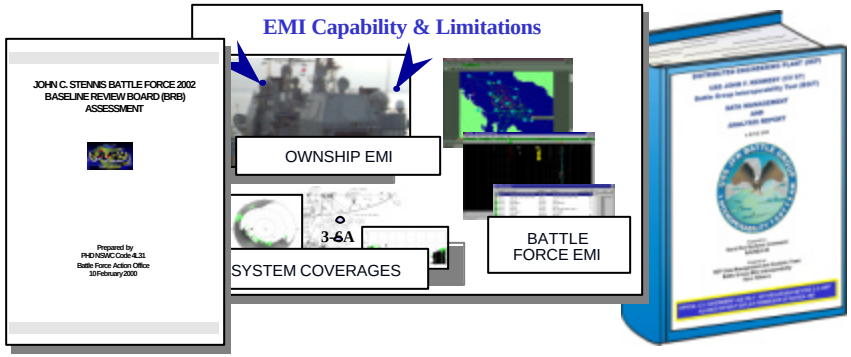


Afloat Master Planning System (AMPS) database and AMPS/SPAWAR Timeline Summaries (TLS) ***(Initial and install)***

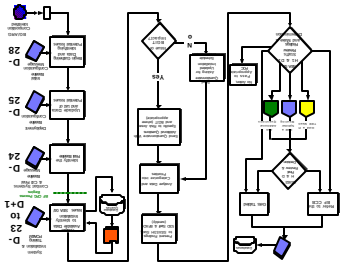
Battle Force Composition message/Authorized Baseline message



Initial Baseline Review (IBR) Assessments ***(incl. EMI/EMC Process)***



Battle Force Capabilities & Limitations Documents



Configuration Planning Group (CPG)

Distributed Engineering Plant (DEP)/ Battle Force Integration Testing (BFIT)

Electronic Configuration Control Board (eCCB)/Radio Msg in A-O Format

- ***Software/Hardware Change Request/Risk Assessment (TCD waiver/TCD offer/Non-standard Installation/Change Request)***

D-30 Process Overview

FLEET CINCs
Battle Force Composition Established
D-30

INITIAL BASELINE REVIEW
Initial Baseline Configuration Defined
D-28

PRE-DEPLOYMENT PLANNING CONFERENCE
Presentation of DRAFT Deployment Baseline
D-25

DEPLOYMENT PLANNING CONFERENCE
Final Baseline Configuration Promulgated
D-24

BATTLE FORCE INTEROPERABILITY TESTING (BFIT)
Distributed Engineering Plant Testing
D-12

PRE-TCD CONFERENCE
Battle Force Briefs Final Configuration
D-10

PRELIMINARY BATTLE FFORCE CERTIFICATION
Interoperability Hardware/Software Install/Preliminary Certify
D-7

TCD
D-6

FINAL BATTLE FORCE CERTIFICATION
Final Baseline Interoperability Certification
D-1

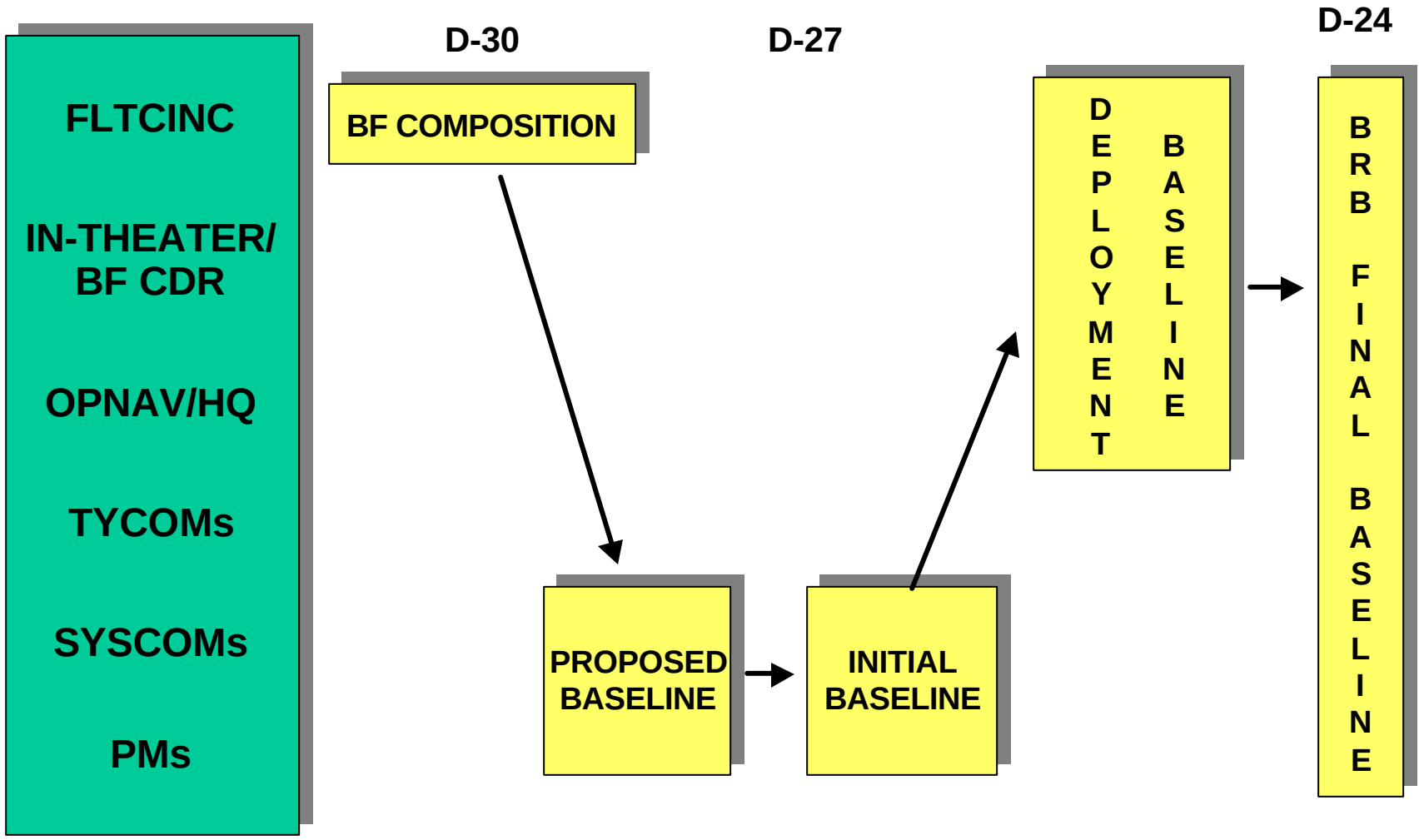
D-24 ELECTRONIC CHANGE CONTROL BOARD (eCCB) D-0

Battle Force Centric

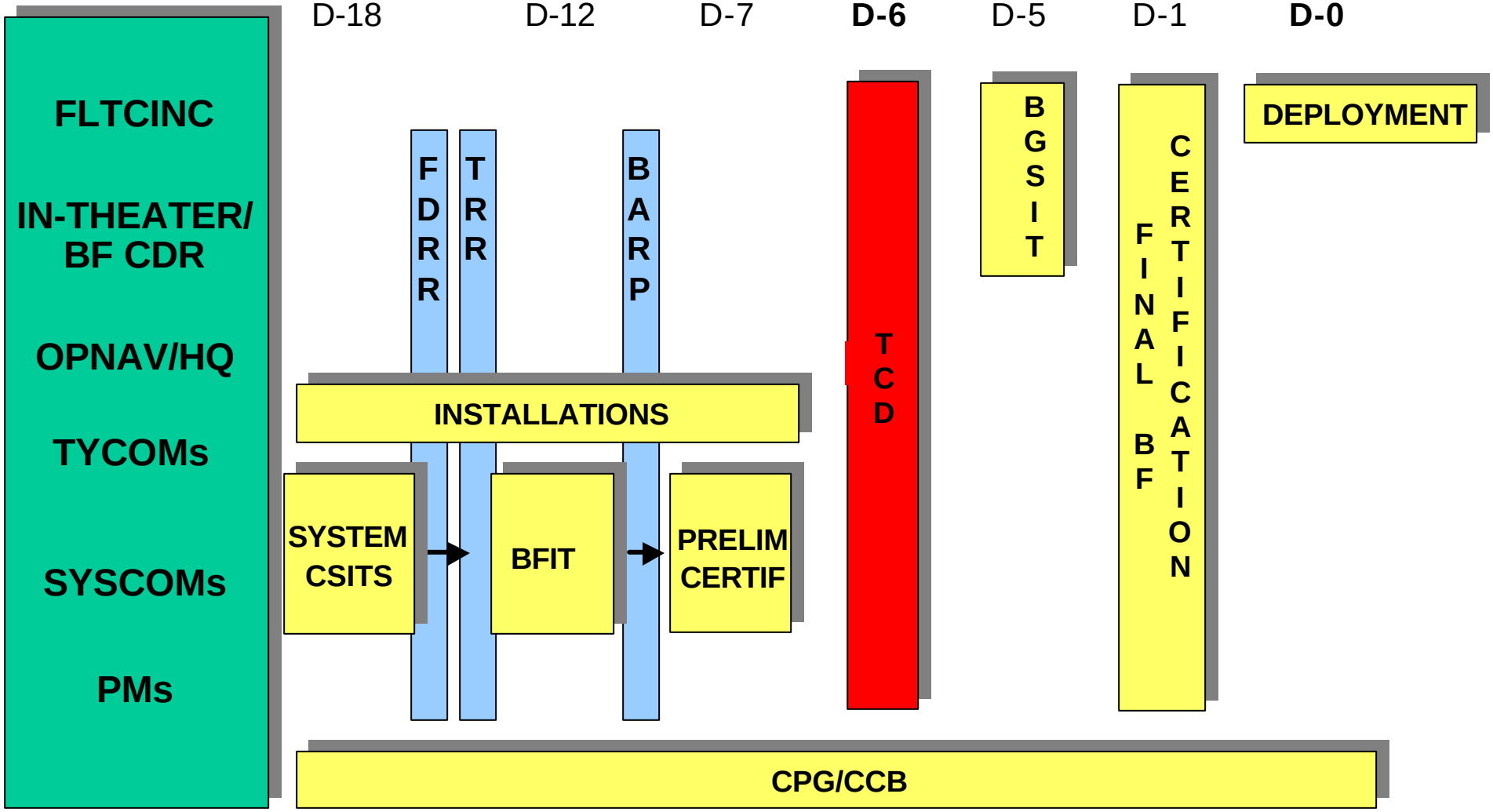
Increased Readiness of Deploying Battle Forces Through Displined Process

*** CINCLANTFLT/CINCPACFLT Instruction 4720.3A (CLF signed 2 FEB 00, CPF signed 27 APR 00)**

D-30 Process Milestones



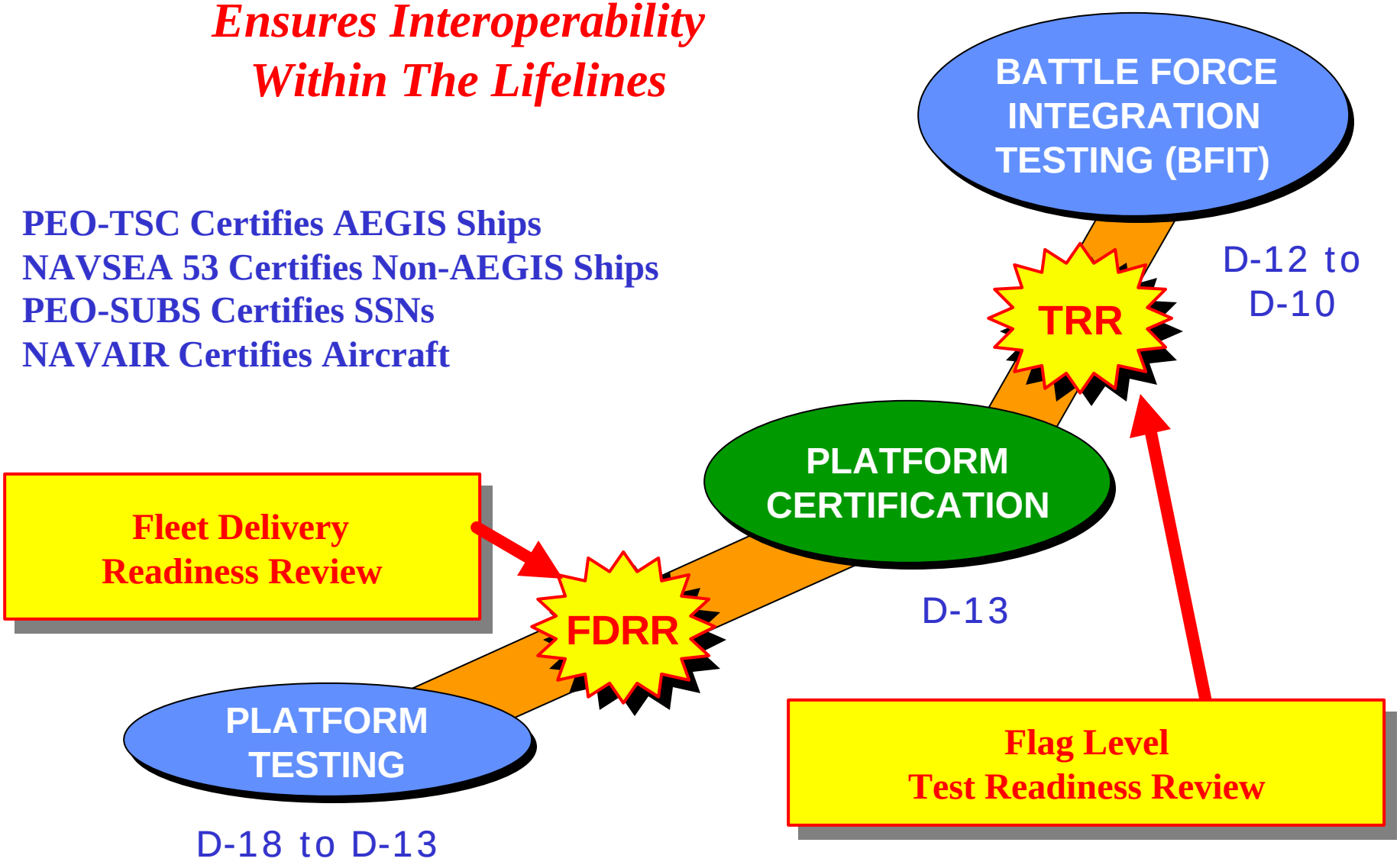
D-30 Process Milestones (cont.)



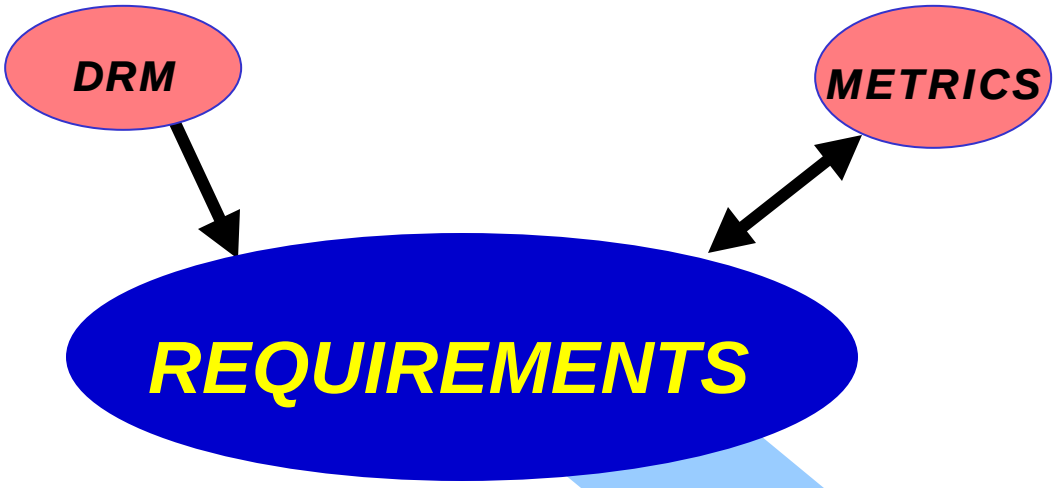
Platform Certification

Ensures Interoperability
Within The Lifelines

PEO-TSC Certifies AEGIS Ships
NAVSEA 53 Certifies Non-AEGIS Ships
PEO-SUBS Certifies SSNs
NAVAIR Certifies Aircraft



BFI Systems Engineering



ENFORCED PROCESS THAT STATES REQUIREMENTS, EXPECTATIONS, AND CRITERIA UP FRONT AND HAS A CERTIFICATION TOOL AT THE END OF THE PROCESS

DEP Overview

- Provides a repeatable "controlled environment" for Testing
  - Reveals "why" vice just replicating interoperability problems
- Enables BF level disciplined systems engineering/testing
  - Vehicle for requirements engineering and MOP/MOE development
- Allows system-level "fault isolation" of I/O problems
  - Controlled environment to evaluate "workarounds" and "fixes"
- Enables validation of Force TT&P prior to deployment
  - Provides input to tailored BF CAPs & LIMs documents

The DEP is the Principal BF Warfare Systems Engineering Tool

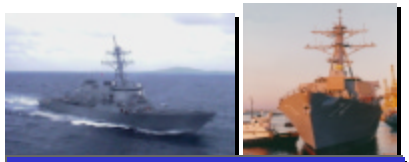
Current DEP Participating LBTS

F-14D
NAWCWD
Pt. Mugu

AEGIS CGs/DDGs
ATRC - Dahlgren

DEP Operations Center
NAVSEA - Dahlgren

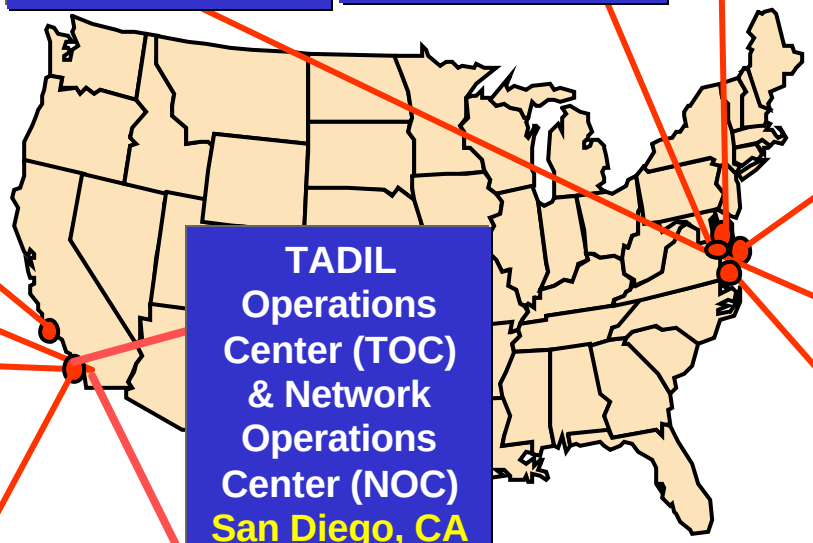
E-2C GII & HE 2000
NAWCAD - PAX River



AEGIS CGs/DDGs
SSDS MK 2
ACSC - Wallops Island

Battle Group LINK Monitor
NCTSI - San Diego

E-2C G0 & GII
SSC - San Diego SIF



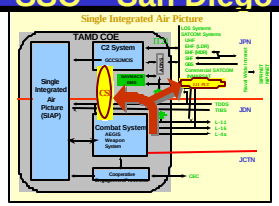
TADIL Operations Center (TOC) & Network Operations Center (NOC)
San Diego, CA

AEGIS CGs/DDGs
ACC - Dahlgren

CV/CVN Class
LHA/LHD Class
DD/FFG Class
NAVSEA/ Dam Neck

CV/CVN Class
LHA/LHD Class
SSDS Mk 2
ICSTF - San Diego

C4ISR
SSC – San Diego



DEP Objectives

- No system or program (interoperable type, as applicable) will be employed on a ship without having been tested in DEP

- No delivery or testing of a program will be allowed during COMPTUEX/JTFEX

- No program will be deployed with a BG that is not in the BG Caps & Lims (if applicable to Caps & Lims)

Only The CINCs Can Grant Waivers

BFI Certification Criteria

- Preliminary BFI Certification:
  - Baseline computer programs shall have been fully tested and certified for unrestricted operational use by the platform level certification authority
  - Baseline computer program shall have successfully completed BFIT in a DEP environment
  - Baseline computer program shall have no unmitigated very high or high risk BFIT Trouble Reports (TR)

BFI Certification Criteria (cont.)

- Final BFI Certification:
  - Preliminary Certification Required, plus:
  - BGSIT/ARGSIT complete and no new very high or high risk BFI issues identified with the results reflected in the final CAPs&LIMs document
  - Joint Data Link Certification complete and no new very high or high risk BFI issues identified with the results reflected in the final CAPs&LIMs document

BFI Certification is Achievable

Test Objectives

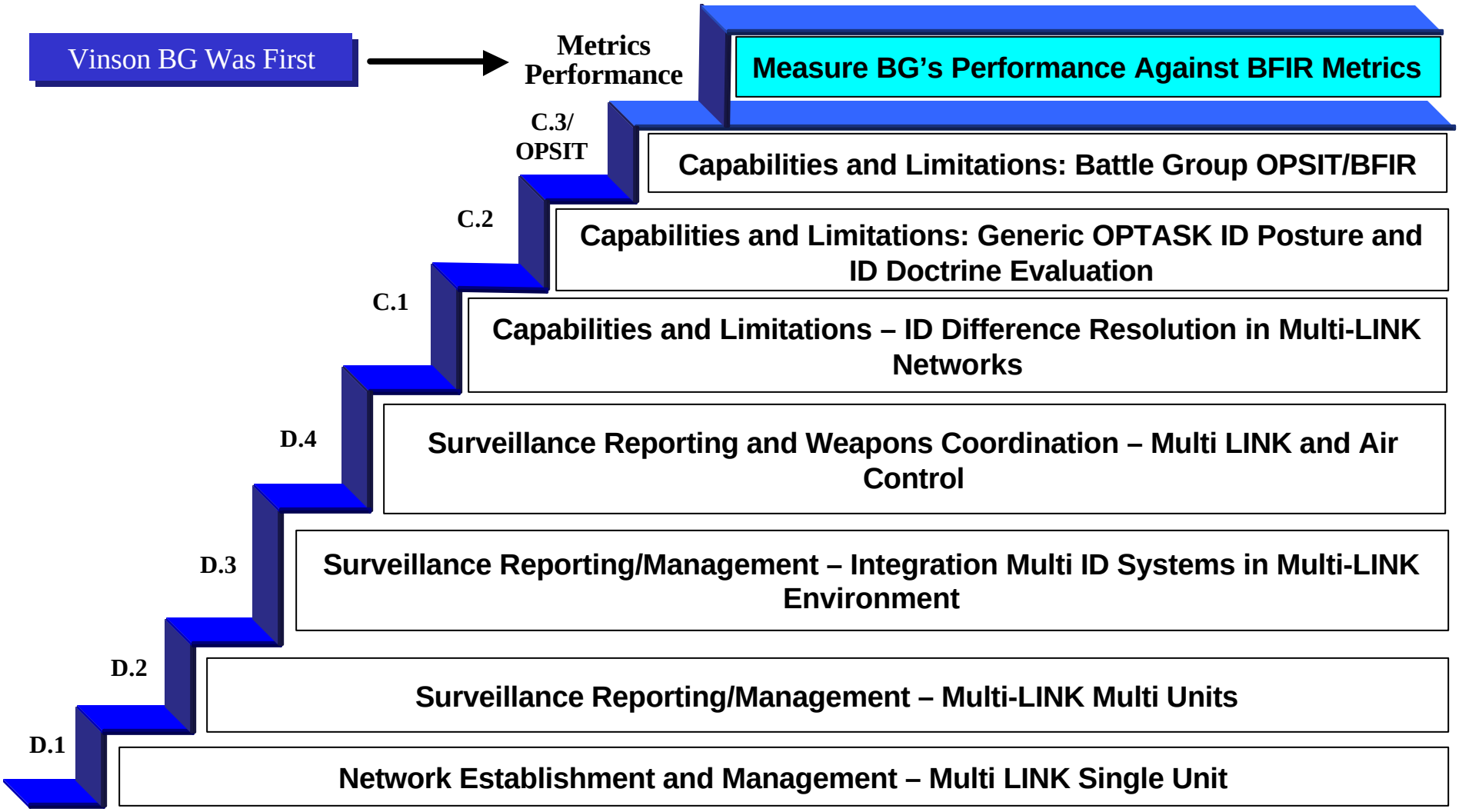
- The Test Objective (TO) is the subject of each test event procedure

  Example "The objective of this event is to demonstrate Battle Force (BF) Interoperability in a single Data Link operating configuration while in a Cooperative Engagement Capability (CEC) network environment. This test event evaluates BF system interoperability while operating in either a Link 11 or Link 16 network with a CEC network established. This test event demonstrates and evaluates BF interoperability in the functional areas relating to surveillance data/track exchange and management, Tactical Data link architecture performance and CEC/Link interoperability."

Test Objectives (cont.)

- The Detailed Test Objectives (DTO) for the test event are then determined
  - The TO and DTO are assigned to the BFIT Test Plan Working Group (TPWG) to design tests that will satisfy the TO and DTO
  - Each TO, driven by the Complex Operational Issue (COI), is specifically written for each test event
  - The DTOs are listed in the test at the steps to be exercised/observed
  - DTO will be exercised numerous times during the test events

BFIT Event Execution Structure



Step-Upward Approach to Testing From Single Platform, Single LINK to Multi-platform, Multi-link While Incorporating Additional Systems and Increasing Test Complexity

BFI Capabilities and Limitations

Tacticians, Trainers, Operators & Developers Sharing Information On The SIPRNET

- Consists of:
  - General LINK Primer
  - BF Capability Matrix
  - BF Limitations & Known Work-Arounds For The Specific BF
  - Operational Considerations & LINK Management
  - Joint Operations
- Distribution:
  - Continuously Updated On The SIPRNET

    http://www.phdnswc.navy.smil.mil
  - CD's Mailed At Approx D-18 & D-2
  - Unclassified "Business Card" CDs Also Distributed

Technical Foundation for Development of Tactics

Interoperability – Future Initiatives

- Ongoing Initiatives
  - Battle Force Interoperability Requirements (BFIR)/Metrics
  - Battle Force Operational Advisory Group (BFI OAG)
- Trade-Off Analysis (Product Improvement/New Development)
  - Identify a preliminary high level decision making methodology for selecting systems that provide interoperability performance improvements
- Joint Distributed Engineering Plant (JDEP)
  - Expand Additional JDEP nodes
- Expansion of DEP Capacity/Capability
  - Multiple battle group scenario
  - Joint/Allied/Coalition Forces
  - Additional Warfare/Mission Areas
  - Pier side Connectivity

Maintain The Momentum